

as
contained between the pin 111 and box 112.

Clean Version of Amended Page 14, line 2 and line 4

The end face of the compression ring forms a metal-to-metal seal, indicated generally at 150a, with a frustoconical seal surface 151a formed on the external surface of the box. At the full makeup position of the compression ring with the box 132, the metal-to-metal seal 150a and the seal ring seal 146 prevent contact of corrosive fluids with the threads 142.

Remarks

Applicants acknowledge with appreciation the indication of allowability of Applicants' Claims 10 and 11, suitably rewritten.

Applicants' Claims 1-17 are herein presented without amendment.

Applicants' drawings and specifications have been amended to correct the objectionable subject matter noted by the Examiner. A copy of the proposed drawing changes is enclosed herewith for the Examiner's convenience. Appropriate corrections will be submitted to the Office Draftsman upon allowance of the application.

Applicants' Claims 1-5 have been rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 2,825,585 to *Griffin*. This rejection is respectfully traversed. The *Griffin* reference teaches a tool joint shrink fitted to the pin of a drill collar. The resulting pin and box connection in the shrink fit is intended to remain connected and is not repeatedly engaged and disengaged during the assembly and disassembly of the drill string as is the case with a conventional tool joint connection.

Applicants' Claim 1 calls for a frustoconical box seal surface formed internally of

the box with the box seal surface having an increasing internal diameter in a direction toward the free box end. It is respectfully submitted that no such structure is taught or suggested in the *Griffin* reference. The most closely related structure in the *Griffin* reference is described as "a smaller diameter smooth cylindrical portion 22." Inspection of Figure 1 of the drawings confirms that the cylindrical portion 22 is closely received within a surrounding cylindrical portion (not numbered) formed within the box of the tool joint 11. It is thus respectfully submitted that the reference lacks the "frustoconical box seal surface" called for in Applicants' Claim 1.

Applicants' Claims 2-5, which depend from and thus further limit Claim 1, are distinguishable over the *Griffin* reference for the reasons herein advanced.

In view of the foregoing, it is respectfully submitted that Applicants' Claims 1-5 are clearly distinguishable over the *Griffin* reference and allowance of the claims is respectfully solicited.

Applicants' Claims 6-9 and 12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,988,127 to *Cartensen* in view of U.S. Patent No. 2,825,585 to *Griffin*. This rejection is respectfully traversed.

Applicants' Claim 6 calls for pin threads being formed on a tubular section of the first tubular body having an outside diameter no greater than an outside diameter of the major length of a first tubular. The Examiner acknowledges that the *Cartensen* reference does not disclose the difference in diameters.

It is stated in the rejection of Applicants' Claim 6 that it would have been obvious to one having ordinary skill in the art to provide an annular ring or seal in *Griffin* "in order to

perform the desirable function of prevent the loosening of the connection." This contention is respectfully traversed.

As previously noted, column 1, lines 58 *et seq* states that the collar end of the tool joint is shrink fitted to the pin on the drill collar.

It is respectfully submitted that there is no annular ring or seal in *Griffin* serving the function of preventing loosening of the connection. The connection is secured by the shrink fitting procedure. It is further respectfully submitted that none of the seals described in *Cartensen* provide any significant contribution to preventing loosening of the connection. *Cartensen* refers to seal rings 36 and 38 that function to provide seals.

It is respectfully submitted that and there is no suggestion or teaching in either the *Griffin* or the *Cartensen* references that would suggest taking teachings of one and combining them with those of the other. It is also respectfully submitted that use of seal rings to prevent loosening of connections is suggested in neither of *Cartensen* nor *Griffin* nor is it disclosed or suggested in Applicants' specification. It is finally respectfully submitted that even if the proposed combination of teachings were to be made, the resulting device would still fail to respond to Applicants' Claim 6.

Applicants' Claim 8 calls for an elastomeric seal ring carried in an annular groove formed in the first tubular body. As employed in the claims, the first tubular body responds to the body carrying the pin threads. The elastomeric seals disclosed in the *Cartensen* reference are carried in grooves formed in the box portion of the connection. The *Griffin et al* reference has no teaching of an elastomeric seal ring.

Similarly, Applicants' Claim 12 calls for the pin to carry an annular, elastomeric seal

ring adjacent the starting point of the pin threads whereby the frustoconical seal surface engages a seal ring. As previously noted, the elastomeric seal rings disclosed in *Cartensen* are carried in the box of the connection and the *Griffin* reference has no teaching of any elastomeric seals.

Applicants' Claims 10 and 11 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,083,821 to *Friend* in view of U.S. Patent No. 2,825,585 to *Griffin*. This rejection is respectfully traversed.

Applicants' Claim 10 calls for an external seal comprising an annular elastomeric seal ring carried externally of the first tubular. Neither the *Friend* nor the *Griffin* patents teach an elastomeric seal of any kind. Applicants' Claim 11 depends from and thus further limits Claim 10.

It is respectfully submitted that even if combined as suggested, the resulting combination would not respond to the limitations of Applicants' Claims 10 and 11. Moreover, it is respectfully submitted that there is no suggestion in either the *Friend* or the *Griffin* reference to make the proposed substitution or combination of parts. Moreover, it is further respectfully submitted that if the proposed combination of teachings were to be made, the resulting device would be unsuitable for its intended use.

Applicants' Claims 13-17 have rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 4,534,585 to *Saliger* and U.S. Patent No. 4,082,326 to *Bryson*. This rejection is respectfully traversed.

The Examiner acknowledges that *Saliger* does not disclose all of the limitations of Applicants' Claims 13-17. Accordingly, it is respectfully submitted that Applicants' Claims

13-17 may not properly be rejected under 35 U.S.C. §102(b) since not every feature in the claims is taught by a single reference. Applicants also traverse the conclusion that *Saliger* discloses the invention as claimed. It is respectfully submitted that neither *Saliger* nor *Bryson* teach Applicants' invention as defined in Applicants' Claims 13-17. Accordingly, it is inappropriate to reject Applicants' Claims 13-17 under 35 U.S.C. §102(b) since neither reference alone teaches all of the limitations of the claims.

It is also respectfully submitted that it is inappropriate to combine teachings of more than one reference when the rejection is made under 35 U.S.C. §102. A reconsideration of the rejection based on the foregoing reasons is respectfully solicited.

In view of the foregoing arguments, it is respectfully submitted that Applicants' claims are patentably distinct over the art of record or any appropriate combination thereof and allowance of the claims is respectfully solicited.

Version of Specification with Markings to Show Changes Made

Page 9, kindly amend line 11 as follows:

Figure 1 illustrates a conventional threaded and coupled connection of the present invention, indicated generally at 10. The connection 10 includes a coupling indicated generally at 12 secured at its free ends to the free pin end of pins 13 and 14 formed at the ends of adjoined pipe segments 15 and 16, respectively. The threaded and coupled connection 10 is comprised of separate threaded connections formed at each end of the coupling 12. The coupling 12 provides a box [end] 17 that cooperates with the pin 13 to provide a first pin and box connection. Similarly, a box 18 at the opposite end of the coupling 12 cooperates with the pin 14 to provide a second pin and box connection.

Page 9, kindly amend line 17 as follows:

The box [section] 17 terminates at one axial end 20 where it engages and seals against the body of the pipe section 15 to form a metal-to-metal seal indicated generally at 21. The seal engagement surface of the box 17 is provided by an internal, frustoconical seal surface 22 adjacent the face of the coupling end 20. The seal engagement surface of the pipe section 15 is provided by a frustoconical seal surface 23 formed along the external surface of the pipe.

Page 9, kindly amend line 25 as follows:

The pin 13 is provided with external threads 25 that engage and mate with internal threads 26 formed within the box 17. At the point 28, engagement of the threads 25 and 26 terminates leaving a gap 30 in which the [runout] run out threads of the pin are exposed. At the appropriate makeup position between the pin 13 and box 17, the metal-to-

metal seal 21 provided by the engaged seal surfaces 22 and 23 prevents entry of fluids from an area A externally of the connection into the annular gap 30 to protect the pin threads from the effects of corrosion.

Page 10, kindly amend line 11 as follows:

With reference to Figure 2, an important aspect of the described form of the present invention is that the [shoulder] seal surface 23 is formed within an external cylindrical surface 34 forming the nominal outside diameter of a major portion of the pipe section 15. The threads 25 on the pin 13 run out on a cylindrical surface 35 having a diameter no greater than the nominal diameter of the pipe surface 34. The illustrated design of Figures 1 and 2 permits the use of non-upset pipe for the pin construction and eliminates the requirement to weld or otherwise affix a large tubular end piece to the pipe section in order to secure a connector that can withstand the effects of dynamic loading in a corrosive environment.

On page 10, kindly amend line 20 as follows:

Figure 3 of the drawings illustrates a modified form of the present invention indicated generally at 36 in which a pipe section [37] 37a with a nominal outside diameter indicated at a cylindrical surface 38 is enlarged to have an outside diameter depicted at 39 to provide a shoulder 41 for a seal surface 42 of a box 45.

On page 10, kindly amend line 20 as follows:

A feature of the embodiment of Figure 3 is that threads 47 on a pin 48 are permitted to run out on the outside diameter of the cylindrical surface [37] 38 which is the same as the nominal outside diameter at 38 of the pipe section 37, permitting the thickness of the

pin 48 of the tubular body to be increased as compared with the form of the invention illustrated in Figure 1. Benefits of the design are that increased structural strength may be provided in the threaded area of the connection and the metal-to-metal seal is effected without a significant increase in the amount of metal in the connection.

On page 13, kindly amend line 5 as follows:

Figure 8 illustrates a modified form of the connector of the present invention indicated generally at 110. The connector 110 includes a pin 111 and a box 112. The pin 111 includes threads 114 that run out on a nominal outside diameter 115 of a pipe section 116. An annular, elastomeric ring 118, having a rectangular cross section, is cemented or otherwise suitably secured to the pin [116] 111 on the outside diameter 115. The ring 118 may be constructed of rubber, Teflon® or other suitable sealing material. An internal, frustoconical seal surface 119 formed adjacent the face 120 of the coupling 112 is adapted to engage and compress the ring 118 to provide the external seal protecting the threads contained between the pin 111 and box 112.

Page 14, kindly amend line 2 and line 4 as follows:

The end face of the compression ring forms a metal-to-metal seal, indicated generally at [150] 150a, with a frustoconical seal surface [151] 151a formed on the external surface of the box. At the full makeup position of the compression ring with the box 132, the metal-to-metal seal [150] 150a and the seal ring seal 146 prevent contact of corrosive fluids with the threads 142.

Respectfully submitted,

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CERTIFICATE OF MAILING

I, Carlos A. Torres, hereby certify that this correspondence and all referenced enclosures are being deposited with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231, on January 14, 2002.

By: Carlos A. Torres